

RURAL WATER RESOURCES STUDY

Rural Water Resources 2003 Questionnaire Report

**Arizona Department of Water Resources
October 2004**

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RURAL WATER RESOURCES STUDY

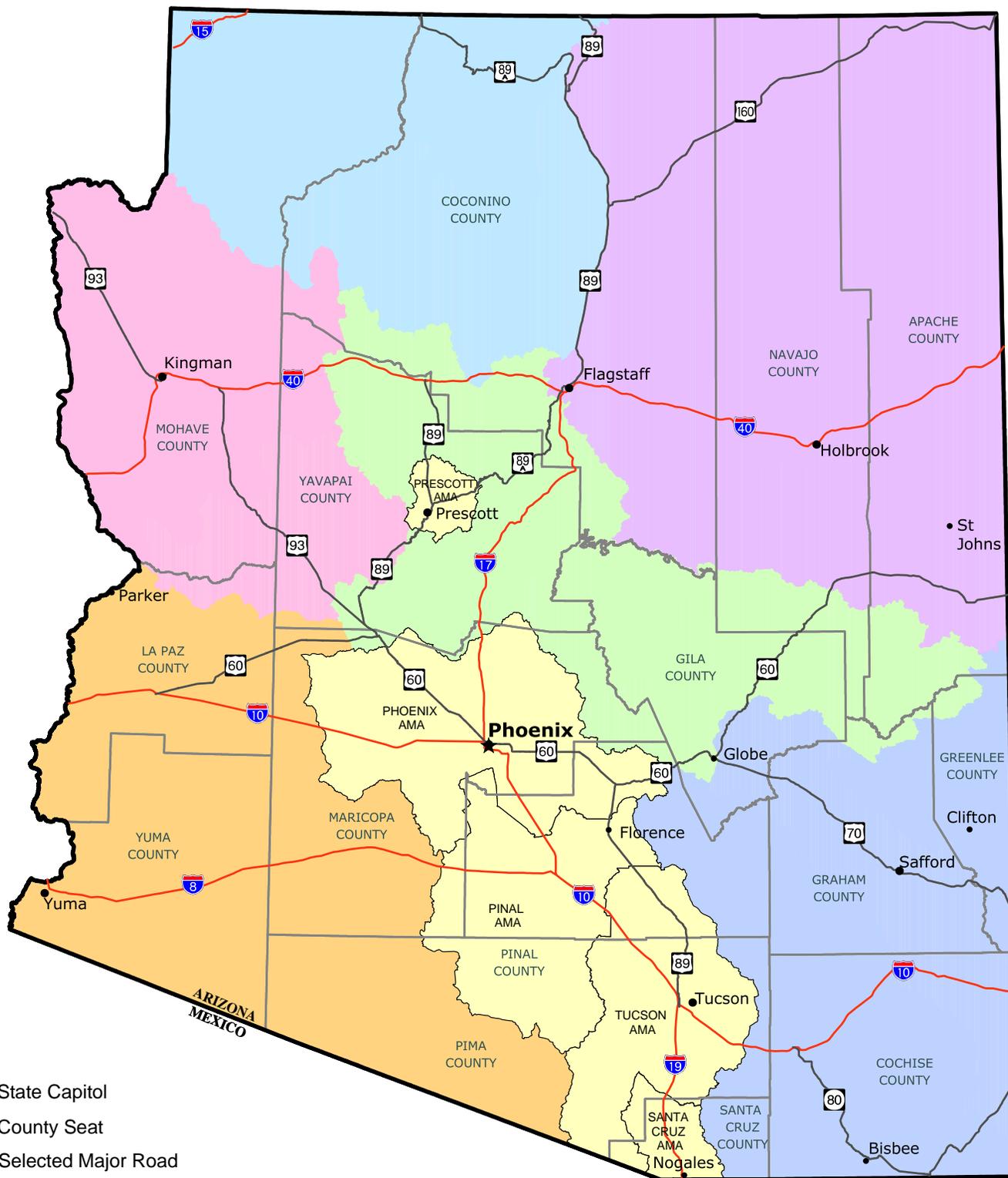
RURAL WATER RESOURCES **2003 QUESTIONNAIRE REPORT**

INTRODUCTION

The Arizona Department of Water Resources (ADWR or Department) has begun to systematically collect and synthesize water-related information for rural Arizona. This report presents the findings of the first step in this effort; the results of a questionnaire distributed in March 2003 to almost 600 water providers, municipalities, tribes, and counties in rural Arizona. The term “rural Arizona” is used to describe that area outside of the state’s five active management areas (AMAs) (Figure 1). The purpose of the rural water resources effort is not only to provide water resource information, but to help identify the needs of growing communities. The Department has begun to compile water resource information into an Arizona Rural Water Atlas organized by groundwater basin and planning area. To support this effort, a second brief and direct contact questionnaire process is now underway that supplements the information gathered in the 2003 questionnaire. Participation in the surveys is very important in order to accurately represent rural water use characteristics and issues. It is anticipated that the Rural Water Atlas will be completed in early 2005.

The metropolitan areas of Casa Grande, Nogales, Phoenix, Prescott, and Tucson are all within AMA boundaries and dominate the state in terms of population, water use, and economic activity. Substantial gains have been made in understanding water use patterns and resolving water supply issues in the AMAs. Within AMAs, the 1980 Groundwater Management Act established management goals, a groundwater rights and data collection system, mandatory conservation requirements, and a requirement to prove an assured water supply prior to subdividing new land; provisions that do not exist outside AMAs.

As a result of high growth rates, physically and legally limited water supplies, drought, economic constraints, and relatively little water resource planning and management, water supplies are stressed in some parts of rural Arizona. In some areas of the state, stakeholders and legislative leaders have expressed the need for additional resources to support local water management efforts.



- ★ State Capitol
- County Seat
- Selected Major Road
- Interstate
- ▭ Arizona Boundary
- ▭ County
- ▭ Active Management Area
- ▭ Central Highlands
- ▭ Eastern Plateau
- ▭ Lower Colorado
- ▭ Southeastern Arizona
- ▭ Upper Colorado
- ▭ Western Plateau

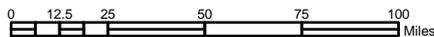


FIGURE 1
ARIZONA PLANNING
AREAS AND COUNTIES

CURRENT AND HISTORIC ADWR RURAL ARIZONA PLANNING EFFORTS

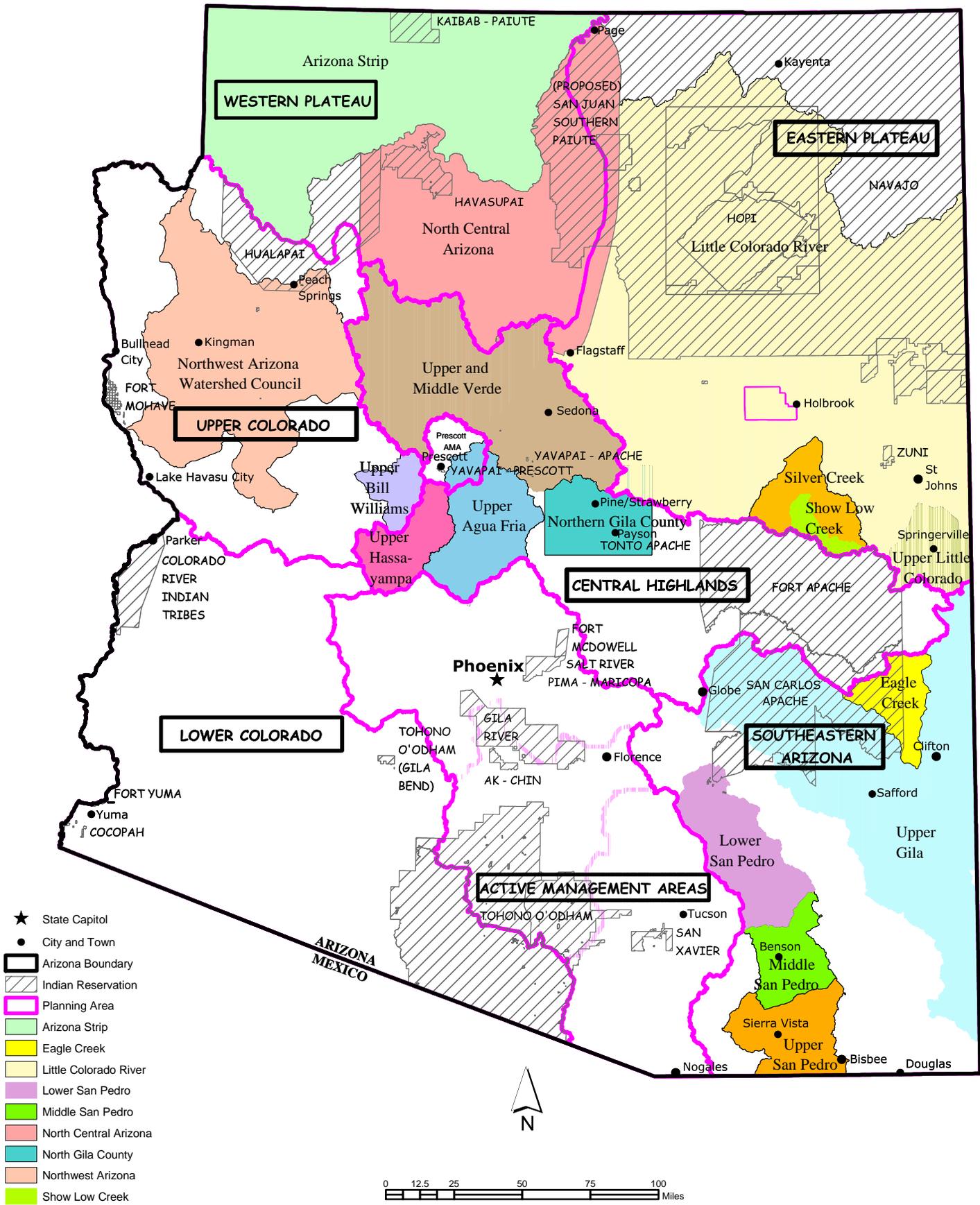
STATEWIDE ASSESSMENT

The only ADWR document that provides a broad overview of water supply and demand conditions and an analysis of water resource management issues statewide is the *Arizona Statewide Water Resources Assessment, 1994* (1994 Statewide Assessment). This document was a continuation of the State Water Plan published in 1975 by the Arizona Water Commission, the predecessor to the ADWR. The 1994 Statewide Assessment discusses statewide water issues and water supply, demand and management issues for six planning areas. Subsequently, one of the planning areas, the Plateau Planning Area, has been divided into the Eastern and Western Plateau Planning Areas. The seven planning areas, which include the AMAs, are shown in Figure 1. The data in the 1994 Statewide Assessment are at least ten years old. An objective of the Rural Water Atlas is to update this information, develop a process that can be readily updated, and construct a database that may eventually result in an interactive product linked to a geographic information system. Like the 1994 Statewide Assessment, the current rural study effort will group groundwater basin information into planning areas.

RURAL WATERSHED INITIATIVE

During the mid 1990s, the need for an increasing focus on water issues in the non-AMA portions of the state began to emerge. ADWR encouraged these regions to form regional groups of stakeholders to work towards local solutions to watershed problems. With technical assistance from ADWR, 17 watershed groups formed to conduct water resource studies and evaluate management options. (See Figure 2, Arizona Rural Watershed Initiative Participants.) Several of the watershed groups were already in place as part of a water quality planning effort by the Arizona Department of Environmental Quality (ADEQ). In 1999, the Rural Watershed Initiative (Initiative) was funded by the Legislature at \$1.2 million for that year to assist the groups with development of information to support water resources planning in their areas. Although funding has continued to diminish since then, matching funds from other entities have assisted in keeping key projects moving that are funded by the Initiative.

The watershed groups vary substantially in terms of resources, staff support, and accomplishments. Of the 17 watershed groups, 15 are actively working on regional solutions to water problems with the ultimate goal of developing a comprehensive water resource management plan for each. Among the most active groups are the Coconino Plateau Water Advisory Council, the Upper San Pedro Partnership, Yavapai Water Advisory Committee (WAC), and the Upper Gila Watershed Partnership. In some basins, especially those with significant resources like the Upper and Middle Verde and the Upper San Pedro, efforts have already produced results in the form of completed and



- ★ State Capitol
- City and Town
- ▭ Arizona Boundary
- ▨ Indian Reservation
- ▭ Planning Area
- ▭ Arizona Strip
- ▭ Eagle Creek
- ▭ Little Colorado River
- ▭ Lower San Pedro
- ▭ Middle San Pedro
- ▭ North Central Arizona
- ▭ North Gila County
- ▭ Northwest Arizona
- ▭ Show Low Creek
- ▭ Silver Creek
- ▭ Upper Agua Fria
- ▭ Upper Bill Williams
- ▭ Upper Gila
- ▭ Upper Hassayampa
- ▭ Upper Little Colorado River
- ▭ Upper Middle Verde
- ▭ Upper San Pedro

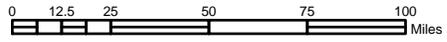


FIGURE 2
ARIZONA RURAL WATERSHED
INITIATIVE PARTICIPANTS

on-going studies, plans, and specific activities to address availability of water. Because of the lack of technical and financial resources and the limited availability of hydrologic data, efforts in other areas may take longer to have tangible results.

Most of these watershed groups: 1) are entirely voluntary with no paid staff, which severely constrains the ability to accomplish a cohesive planning effort; 2) have inadequate hydrologic data; and 3) do not, in some cases, involve key players (such as the managers of the water companies and representatives from the agricultural community), making comprehensive planning difficult.

A key component of the Initiative approach is that it helps local citizens find solutions that match the specific problems in their own regions. Although the state's budget constraints have limited the ability of stakeholders and the Department to finance and complete hydrologic studies and develop comprehensive plans, the Department remains committed to supporting the watershed partnerships in finding solutions to the water resource challenges in rural Arizona.

GROWTH IN RURAL ARIZONA

Rapid growth in some rural Arizona communities is already straining water resources. The non-AMA portions of the state encompass 87% of Arizona's land area (Arizona Town Hall, 1997) and approximately 950,000 people, about 18% of the state's total population (U.S. Census, 2000). Arizona Department of Economic Security (DES) projections are that rural population growth will nearly double in the next 50 years. This growth represents increasing demands on water resources in the future.

Table 1 shows communities, including census designated places (unincorporated areas), by planning area, selected based on their average annual growth rate between the 1990 and 2000 Census in two categories: greater than 5% growth, and 2% to 5% growth. Included in the list are tribal communities. While growth rates are quite high in some rural areas, only San Luis, Quartzite, Lake Havasu City, Wellton, and Payson are within the top 20 fastest growing incorporated cities and towns in Arizona (ranked number 5, 15, 18, 19, and 20, respectively). Note that the growth rates shown are not the annualized growth rates, but instead are the average annual or compound growth rates. The location of these communities relative to the planning area boundaries are shown in Figure 3. As shown, concentrations of high growth rate communities are found in the Lake Mohave, Sacramento Valley, Little Colorado River Plateau, Safford, Upper San Pedro, Verde River, and Yuma Basins.

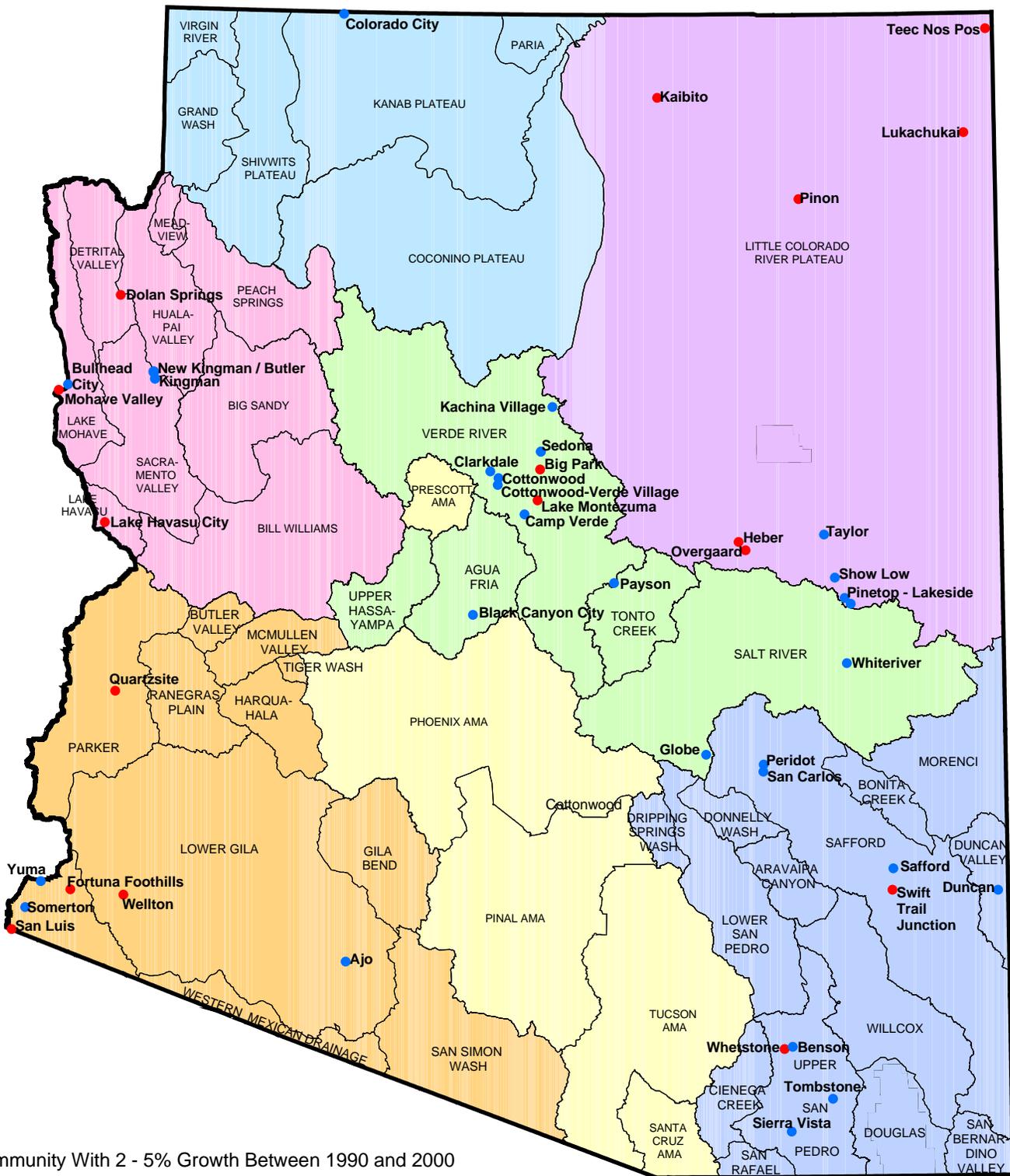
SUMMARY OF 2003 QUESTIONNAIRE RETURNS

The 2003 Rural Questionnaire distributed to almost 600 water providers, municipalities, tribes, and counties in rural Arizona was intended to gather information

**TABLE 1
RURAL COMMUNITIES WITH AVERAGE ANNUAL GROWTH RATES > 2%**

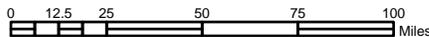
Planning Area/Community		1990 Census	2000 Census	Average Annual Growth Rate	Projected 2050 Pop. (DES)
UPPER COLORADO					
(>5% Growth)	Dolan Springs CDP	1,090	1,867	5.53%	2,054
	Lake Havasu City	24,363	41,938	5.58%	94,457
	Mohave Valley CDP	6,962	13,694	7.00%	22,160
(2-5% Growth)	Bullhead City	21,951	33,769	4.40%	71,423
	Kingman	12,722	20,069	4.66%	38,737
	New Kingman/Butler CDP	11,627	14,810	2.45%	39,033
LOWER COLORADO					
(>5% Growth)	Fortuna Foothills CDP	7,737	20,478	10.22%	64,043
	Quartzite	1,876	3,354	5.98%	7,077
	San Luis	4,212	15,322	13.78%	47,244
	Wellton	1,066	1,829	5.55%	2,377
(2-5% Growth)	Ajo CDP	2919	3705	2.41%	NA
	Somerton	5,282	7,266	3.24%	16,296
	Yuma	56,966	77,515	3.51%	154,855
SOUTHEASTERN					
(>5% Growth)	Swift Trail Junction CDP (Safford)	1,203	2,195	6.20%	6,574
	Whetstone CDP	1,289	2,354	6.21%	2,548
(2-5% Growth)	Benson	3,824	4,711	2.11%	4,806
	Duncan	662	812	2.06%	1,217
	Peridot CDP	957	1,266	2.84%	3,192
	Safford	7,359	9,232	2.29%	18,776
	San Carlos CDP	2,918	3,716	2.45%	4,220
	Sierra Vista SE CDP	9,237	14,348	4.50%	16,854
Tombstone	1,220	1,504	2.11%	1,789	
EASTERN PLATEAU					
(>5% Growth)	Heber-Overgaard CDP	1,581	2,722	5.58%	2,761
	Kaibito CDP	641	1,607	9.63%	2,269
	Lukachukai CDP	113	1,565	30.06%	*
	Pinon CDP	468	1,190	9.78%	*
	Teec Nos Pos CDP	317	799	9.69%	1,092
(2-5% Growth)	Pinetop-Lakeside	2,422	3,582	3.99%	6,064
	Show Low	5,020	7,695	4.37%	13,353
	Taylor	2,418	3,176	2.76%	5,565
CENTRAL HIGHLANDS					
(>5% Growth)	Big Park CDP	3,024	5,245	5.66%	11,363
	Lake Montezuma CDP	1,841	3,344	6.15%	4,969
(2-5% Growth)	Black Canyon City CDP	1,811	2,697	4.06%	4,939
	Camp Verde	6,243	9,451	4.23%	19,300
	Clarkdale	2,144	3,422	4.79%	6,571
	Cottonwood	5,918	9,179	4.49%	24,109
	Cottonwood-Verde Village CDP	7,037	10,610	4.19%	10,905
	Globe	6,062	7,486	2.13%	9,827
	Kachina Village CDP	1,711	2,664	4.53%	4,397
	Payson	8,377	13,620	4.98%	29,444
	Sedona	7,720	10,192	2.82%	19,591
Whiteriver CDP	3,775	5,220	3.29%	9,181	
WESTERN PLATEAU					
(2-5% Growth)	Colorado City	2,426	3,334	3.23%	9,010

CDP = Census designated place (unincorporated); * Projections less than 2000 census.



- Community With 2 - 5% Growth Between 1990 and 2000
- Community With > 5% Growth Between 1990 and 2000

- ▭ Arizona Boundary
- ▭ Groundwater Basin
- ▭ Active Management Areas
- ▭ Central Highlands
- ▭ Eastern Plateau
- ▭ Lower Colorado
- ▭ Southeastern
- ▭ Upper Colorado
- ▭ Western Plateau



**FIGURE 3
RURAL PLANNING AREAS AND
GROUNDWATER BASINS WITH HIGH
GROWTH RATE COMMUNITIES**

about water supply and water use, and to identify water issues and needs. This information will be included in the Rural Water Atlas, which is intended to support rural water planning efforts and help determine the potential role of the state in developing solutions.

The 2003 Rural Questionnaire consisted of three separate questionnaires with questions designed for the particular group of respondents; one for water providers, one for jurisdictions, and one for tribes and counties. The water provider mailing list was compiled from review of the ADEQ Drinking Water database. This list of approximately 5,000 systems was culled to remove all water companies inside of AMAs. A total of 177 questionnaires were returned and, of these, 171 questionnaires are evaluated in this report. The six questionnaires not evaluated in this report were either agricultural operations, located in AMAs, or otherwise not applicable. This is considered a good response rate, considering that the questionnaires ranged up to six pages in length and in many cases required data gathering and synthesis efforts. Data were entered in an electronic ACCESS database.

**TABLE 2
QUESTIONNAIRE RESPONSE RATE**

Questionnaire Type	Number Sent	Number Returned and Evaluated	Percent Returned and Evaluated
Water Provider	496	136	27.4%
Jurisdiction	54	22	40.7%
Tribal and County	38	13	34.2%
<i>Tribal</i>	23	3	13.0%
<i>County</i>	15	10	66.7%
TOTAL	588	171	29.1%

The questionnaires themselves and the results discussed in this report should not be considered to be a highly scientific investigation nor the number of responses a statistically representative sample. Water resource situations may vary dramatically between areas and even between nearby providers so care must be taken when interpreting the questionnaire results. One should not conclude that these questionnaire responses characterize all of rural Arizona or even a particular basin or planning area. Nonetheless, some general observations can be drawn from the responses and these are discussed in the next sections. It is hoped that the results from the 2004 questionnaire will help to better characterize issues and conditions in rural Arizona.

The types of questions and question number (Q#) in each of the three questionnaires are listed below. Similar questions about water-related issues, drought impacts, and water conservation were included in all questionnaires. Copies of the questionnaires are found in Appendix A.

Water Provider Questionnaire

Water Demand

- Number of current and past domestic connections and current population (Q3)
- Amount of water served to any non-residential customers, by type (Q4)
- Amount of water used by source (Q7)
- Do zoning requirements or homeowners association restrictions result in increased water use (Q24)

Wells and Measurement

- Whether wells and delivery connections are metered (Q5, Q6)
- Number and status of wells (active/inactive) (Q8)

Growth/Expansion

- Expansion potential of water company and of any others in area (Q9, Q10, Q11)
- Projected new large customers (Q12)

Domestic Wells

- Do a large number of domestic wells exist in the service area and do they create problems (Q13)

Sewer v. Septic

- The percentage of the units in the service area served by a centralized wastewater system (Q14)

Water-Related Issues

- Rank a list of issues including storage, pumping capacity, water levels in wells, need for additional supplies, aging infrastructure, water quality, water rates, drought, etc. (Q15)

Water Rates

- Rate structure and volume of the average monthly domestic bill in summer and winter (Q16, Q17)

Water Conservation Program

- Type of conservation program present and what type of assistance would be most valuable (Q18, Q19)

Drought

- Drought impacts, whether a drought plan is in place and what type of drought assistance would be useful (Q20, Q21, Q22, Q23)

Water Management

- Suggestions for improving water management (Q25)

Jurisdiction Questionnaire

Water Providers

- Types of providers serving the jurisdiction and which are most likely to expand to serve new customers (Q2, Q3)

Water Demand

- Estimated percentage of type of water delivered and population within jurisdiction (Q4, Q5)
- New non-residential users proposed (Q6)
- Whether domestic wells were a significant source of water (Q7)

Land Use/Water Use

- Whether lot splitting was a significant concern and if it posed a water supply problem (Q8)
- Whether zoning or homeowners association restrictions resulted in increased water use (Q13)

Sewer v. Septic

- The percentage of the units in the service area served by a centralized wastewater system (Q9)

Water-Related Issues

- Rank a list of issues including storage, pumping capacity, water levels in wells, need for additional supplies, aging infrastructure, water quality, water rates, drought, etc. (Q10)

Water Conservation Program

- Type of conservation program present and what type of assistance would be most valuable (Q11, Q12)

Drought

- Drought impacts, whether a drought plan is in place and what type of drought assistance would be useful (Q16, Q17)

Plans/Management

- Existence of a water supply plan or water resources element, or a drought plan (Q14)
- Impression of Growing Smarter program (Q15)
- Suggestions to improve water management (Q18)

County and Tribal Questionnaire

Planning

- Existence of a water supply plan or water resources element in county plan (Q2)
- Evaluation of current planning process for water planning perspective (Q3)
- Impression of Growing Smarter program (Q13a)
- Existence of a water element in comprehensive plan if not required (Q13b)

Land Use/Water Use

- Identification of lands without adequate water supplies for current users (Q4)
- Any proposed new large developments or large commercial/industrial facilities planned and category of use (Q5)
- Whether lot splitting is an issue (Q6)

Water-Related Issues

- Rank a list of issues including storage, pumping capacity, water levels in wells, need for additional supplies, aging infrastructure, water quality, water rates, drought, etc. (Q7)

Legislation/Assistance

- What legislation or state assistance would be of greatest benefit to ensure future water supplies (Q8)

Water Conservation Program

- Type of conservation program present and what type of assistance would be most valuable (Q9)

Drought

- Drought impacts, whether a drought plan is in place and what type of drought assistance would be useful (Q10, Q11, Q12)

As shown in the preceding questionnaire summaries, all potential respondents were asked to rank any water-related issues they faced. Respondents were not consistent in the way in which they responded; some checked all issues that applied without ranking them. The question was not identical in all questionnaires, so all responses cannot be compared; however, many of the same issues were listed. As an example of the types of issues listed, water providers were asked to rank the following 18 issues that applied to their system:

- Inadequate reservoir or storage capacity to meet peak demand
- Inadequate well pumping capacity to meet peak demand
- Lowering water tables near wells
- Need for additional water supplies to meet current demand
- Need for additional water supplies to meet future demand
- Aquifer productivity problems
- Aging infrastructure in need of replacement
- Current violations of water quality standards
- Past violations of water quality standards
- Ability to meet new arsenic standard
- Ability to meet nitrate standard
- Concern about proximity of wells to sources of contamination
- Inadequate sources of capital to pay for infrastructure improvements
- Concern about proximity of wells to surface water flows
- Lack of central wastewater treatment and collection systems

- Inadequate rate structure, outdated service charges
- Concern about habitat impacts related to groundwater use
- Drought related water supply problems
- Other.

The question on water-related issues provides a preliminary indication of the most important issues facing rural Arizona. However, while the response rate was high, it is not comprehensive and it is hoped that the 2004 Questionnaire effort will provide a broader inventory of rural issues.

The 2003 Rural Water Resources Study Questionnaire was developed in part to provide information to the Governor's Drought Task Force established by Executive Order 2003-12 on March 20, 2003. Therefore, it contained drought related questions as part of the issues identification effort. The question varied depending on the questionnaire type and asked about impacts and types of assistance that would be helpful in preparing for drought. Water providers were also asked if they had a drought plan.

The next section of this report summarizes responses received from each of the three types of questionnaires. Also included is a generalized issues identification by planning area and brief general observations of the responses.

COUNTY AND TRIBAL QUESTIONNAIRE RESPONSE

The response rate by counties was high with responses received from 10 of the 15 counties. Only three tribal responses were received of the 23 mailed. County responses were received from Coconino, Gila, Greenlee, Maricopa, Mohave, Navajo, Pima, Santa Cruz, Yavapai, and Yuma Counties. Tribal responses were received from the Hopi Tribe, the Tohono O'odham Utility Authority, and from the San Xavier District of the Tohono O'odham Nation. Table 3 lists the number of responses to each of the yes/no format questions in the survey. Also listed is the number of incidents of no response (NR).

TABLE 3
COUNTY AND TRIBAL RESPONSES TO SELECTED YES/NO QUESTIONS

Question (Q#)		YES	NO	NR
Do you have a water supply plan or water resources element in county or tribal plan? (Q2)	<i>County (10 total)</i>	4	5	1
	<i>Tribal (3 total)</i>	1	1	1
Is the current planning process adequate for water supply planning? (Q3)	<i>County</i>	1	8	1
	<i>Tribal</i>	1	1	1
Are there portions of the county or tribal lands without adequate water supplies? (Q4)	<i>County</i>	6	4	0
	<i>Tribal</i>	2	1	0
Are there proposed new large developments or commercial/industrial facilities with water demand that would exceed 5% of the current water use? (Q5)	<i>County</i>	3	5	2
	<i>Tribal</i>	2	1	0
Is lot splitting a concern? (Q6)	<i>County</i>	10	0	0
	<i>Tribal</i>	1	2	0
Do you have a water conservation program? (Q9)	<i>County</i>	1	7	2
	<i>Tribal</i>	2	1	0
Has the drought significantly affected your County or Tribe? (Q10)	<i>County</i>	6	3	1
	<i>Tribal</i>	3	0	0

NR= no response.

OBSERVATIONS FROM TABLE 3

- For those responding, almost half had either a water plan or a water resource element in their county or tribal plan. However, almost all felt that the planning process was inadequate from a water supply planning perspective.
- More than half the respondents have areas with water supply problems. Some mentioned excessive depths to groundwater, which necessitated hauling water, declining water levels, areas with poor quality water, and low aquifer productivity.
- Lot splitting was noted by all counties as a problem. Lot splitting causes a proliferation of individual wells, are not subject to subdivision requirements including the adequate water supply rules, and may cause service and infrastructure concerns.
- Very few respondents reported having a water conservation program although it should be noted that these programs are typically under the purview of a water provider.
- Most respondents noted a significant impact from drought. When these respondents were asked to select what impacts had been experienced, more than half mentioned inadequate supplies for grazing and wildlife, for potable water, and for fire suppression.

COUNTY AND TRIBAL ISSUES IDENTIFICATION

Counties and tribes were requested to rank 14 water-related issues faced by water companies in their county or nation. Table 4 contains a summary of the number of responses for those issues most commonly identified. Shown are both the number of total responses and the number of respondent that listed the issue as being among the top five.

**TABLE 4
MOST PREVALENT WATER-RELATED ISSUES
IDENTIFIED BY 10 COUNTY AND 3 TRIBAL RESPONDENTS**

	Need for additional supplies to meet future demand	Lowering water tables near wells	Need for additional supplies to meet current Demand	Aging infrastructure in need of replacement	Inadequate capital for infrastructure improvement	Aquifer productivity problems
Counties (Identified as an issue)	6	6	5	5	5	5
Counties (Listed as a top 5 issue)	4	3	3	3	3	1
Tribes (Identified as an issue)	3	2	2	2	2	2
Tribes (Listed as a top 5 issue)	2	2	1	1	0	2

Issues related to availability of physical water supplies and to infrastructure were ranked highest by the respondents. While tribal response was very limited, all were concerned with the ability to meet future demands. This was also a concern of more than half of the responding counties.

WATER CONSERVATION

Counties and Tribes were asked if they had a water conservation program and if so, what types of programs were offered. Water conservation programs are typically implemented by water providers, and only one county reported having a program consisting of conservation oriented planning policies. Two of the three tribes reported having a program that includes conservation literature, conservation ordinances, and conservation oriented planning policies.

DROUGHT IMPACTS

As mentioned previously, most respondents reported that they had experienced drought impacts. They were asked to identify the drought impacts and what kinds of assistance would be useful in preparing for drought. The most prevalent impact reported was inadequate water supplies for grazing and wildlife. Responses from the 10 county and 3 tribal questionnaires returned were:

- 5 counties and all tribal respondents experienced an inadequate supply for grazing and wildlife
- 3 counties and one tribe experienced an inadequate supply of potable water
- 2 counties and one tribe experienced an inadequate supply for fire suppression
- 2 counties mentioned significant impacts from bark beetles.

Types of drought assistance suggested by the counties were:

- Assistance with preparing drought and water conservation plans
- Identification of specific areas where drought conditions have significantly affected water supplies
- More information on water supply availability of groundwater basins, including determining the committed demand in order to assess water supply adequacy
- Drought status presentations
- Prepackaged water conservation public education program
- Regulation of lot splits
- Coordinate planning efforts
- Access to more drought resistant water supplies
- Increased water storage and access capability.

Types of drought assistance suggested by the tribes were:

- Alternate water source development and assistance with providing or improving hauling capabilities
- Better planning, better water storage, and better conservation
- Assistance with developing and implementing a range management plan.

JURISDICTION QUESTIONNAIRE RESPONSE

Responses were received from 22 of the 54 jurisdictions (i.e., cities and towns) that were queried. Of these, 13 are municipal water providers. Responses were received from Bisbee, Bullhead City, Camp Verde, Clarkdale (submitted by Wilhoit Water Company), Clifton, Cottonwood, Eager, Gila Bend, Holbrook, Huachuca City, Kearny, Miami, Payson, Pinetop-Lakeside, Safford (submitted by Gila Resources, Inc.), San Luis, Sedona, Show Low, Springerville, Taylor, Wickenburg, and Winslow. Table 5 lists the number of responses to each of the yes/no format questions in the survey. Also listed is the number of incidents of no response (NR).

TABLE 5
JURISDICTION RESPONSES TO SELECTED YES/NO QUESTIONS

Question (Q#)	YES	NO	NR
Are there proposed commercial/industrial facilities with water demand that would exceed 5% of the current water use? (Q6)	4	16	2
Are private domestic wells a significant source of water for households in the area? (Q7)	8	12	2
Is lot splitting a concern? (Q8)	5	15	2
Do you have a water conservation program? (Q11)	10	11	1
Do zoning requirements or homeowners association restrictions result in increased water use? (Q13)	2	19	1
Do you have a water supply plan or water resources element? (Q14a)	9	11	2
Do you have a drought response plan? (Q14b)	5	15	2
Has the drought affected your jurisdiction's water supply? (Q16)	10	10	2

NR = no response.

OBSERVATIONS FROM TABLE 5

- Only 4 of the 22 jurisdictions that responded projected construction of a new, large water using non-residential facility in their area. Types of facilities listed were a prison, power plant, and multi-family housing. This response differs from the question asked of counties and tribes who were also asked about residential developments.
- About half of the respondents reported that private domestic wells were a significant source of water for households in the area in which water companies operated.
- Unlike the county/tribal response, lot splitting was not identified as a major concern by jurisdictions.
- About half of the respondents have a water conservation program.
- The existence of zoning requirements that result in increased water use is apparently rare, with only two positive responses.
- Less than half of the respondents have a water supply plan or a water resource element.
- About half of the respondents (45%) reported a drought related impact on their water supply. Only 5 of the 22 respondents have a drought plan.

JURISDICTION ISSUES IDENTIFICATION

Jurisdictions were requested to rank 18 water-related issues faced by water companies within the jurisdiction. Table 6 contains a summary of the number of

responses for those issues most commonly identified. Shown are both the number and percentage of total responses and the number and percentage of respondents that listed the issue as one of their top five issues.

**TABLE 6
MOST PREVALENT WATER-RELATED ISSUES
IDENTIFIED BY 22 JURISDICTION RESPONDENTS**

	Aging infrastructure in need of replacement	Need for additional supplies to meet future demand	Inadequate capital for infrastructure improvement	Drought related water supply problems	Inadequate reservoir or storage capacity to meet peak demand	Ability to meet new arsenic standard
Identified as an issue	15 (68%)	14 (64%)	12 (54%)	12 (54%)	11 (50%)	10 (45%)
Listed as a top 5 issue	11 (50%)	8 (36%)	7 (32%)	5 (23%)	4 (18%)	6 (27%)

Aging infrastructure and the need for additional supplies to meet future demand were the most prevalent issues identified by the jurisdictions that responded. More than half noted that drought had caused water supply problems, although only about one in five listed drought as among their top five most serious issues. Funds for capital improvements, inadequate storage, and the ability to meet the new arsenic water quality standard were also among the most frequently mentioned problems.

WATER CONSERVATION

Almost half of the jurisdiction respondents reported having a water conservation program. The primary type of program consisted of conservation literature available at an office although a few reported more active programs such as conservation literature distribution, ordinances, and short-term water use restrictions related to drought or water supply limitations. Responses to the question of what type of assistance would be most valuable to expanding their conservation program varied. Rebate programs, short-term water use restrictions, and conservation oriented hook-up policies were most often listed as needed activities requiring assistance.

DROUGHT IMPACTS

When asked directly, almost half the respondents reported having been affected by drought. However, only five of the responding jurisdictions reported having a drought response plan. Of those 10 responding jurisdictions affected by the drought, the most

prevalent impacts were increased demand, reduction in the water supply, and lowered groundwater pumping levels:

- 6 experienced an increase in potable water demand
- 6 experienced reductions in available potable water supplies
- 6 experienced lower groundwater pumping levels
- 4 experienced reductions in surface water supplies.

None of the 22 jurisdictional respondents reported that trucking of water was necessary to meet customer needs.

The types of assistance most commonly mentioned by the 22 jurisdictions as being useful to prepare for drought were:

- Drought triggered conservation programs (50%)
- Ability to charge higher fees for higher volume deliveries (41%)
- More advance warning of drought conditions (36%)
- Ability to distribute current climate information to customers (23%)
- Ability to restrict water deliveries (23%).

WATER MANAGEMENT

A question in the Jurisdiction Questionnaire provided an opportunity for respondents to make suggestions for improving water management. A list of options was not provided. Suggestions included:

- Thin forests in watersheds to increase water production
- Financial assistance to acquire private water companies
- Need to integrate hydrologic studies into a regional water management plan
- Customer landscape irrigation education and reuse
- A statewide conservation approach would benefit rural areas
- Subdivisions should not be approved without adequate water supply
- Reduction of institutional barriers to local water supply development (federal land use procedures, etc.)
- Investment of effort and funds by the state to develop water supplies for rural communities proportionate to decades of investment in ensuring adequate supplies for major metropolitan areas.

WATER PROVIDER QUESTIONNAIRE RESPONSE

The water provider version of the 2003 questionnaire included questions about numbers of customers, population, whether non-residential customers are served, if pumpage and delivery volumes are metered, annual volume of water used, and system

information in addition to questions about water-related issues, expansion, drought, and water conservation found in the other questionnaires. While 141 water provider questionnaires were returned, five were eliminated since they were agricultural or other non-water provider entities or were located within an AMA. The remaining 136 respondents, listed in Appendix B, are divided into the categories shown in Table 7. For this analysis, results are separated into “municipal water provider” and “other” (military/industrial/school). Responses were received from municipal water provider systems representing service to a total of over 317,000 people.

**TABLE 7
NUMBER OF RESPONSES
BY TYPE OF WATER PROVIDER**

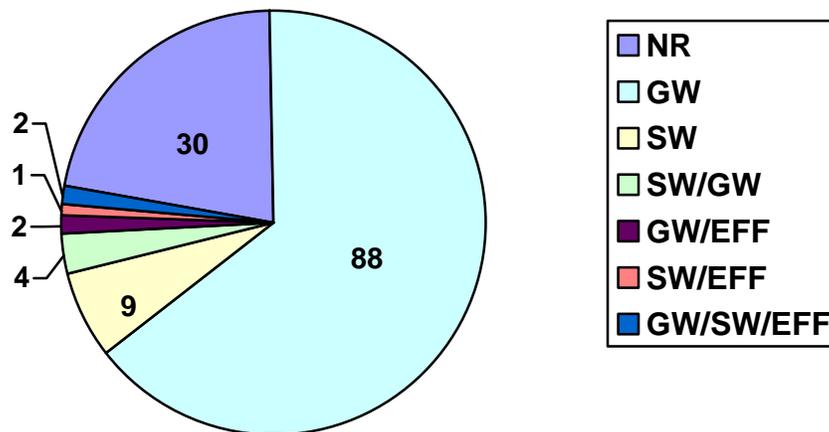
Water Provider Type	Number of Responses
Federal military facility	8
Industrial facility (power generation, etc.)	4
School	10
Municipal	114
<i>Public and quasi-public systems</i>	28
<i>Private Water Co., HOA, Co-ops</i>	86
TOTAL	136

HOA = homeowners association.

WATER SUPPLY AND DEMAND

Most systems reported using groundwater. Sixteen water providers (13 “municipal” and 3 “other”) also reported using surface water. Of these, nine reported using only surface water. (See Figure 4.) Only five municipal responses reported that effluent was part of their supply, although it should be noted that there is increasing effluent use by some rural communities, e.g., communities in the Southeastern, Central Highlands, and the Eastern Plateau Planning Areas. Trucking water was reported as part of normal operations by five municipal water systems. These responses suggest that systems are primarily groundwater dependent and that all but a few have sufficient water supplies to serve current customers. However, trucking water is a widespread practice in some rural areas, especially on the Colorado Plateau and including areas of the Navajo and Hopi Reservations.

FIGURE 4
SOURCE WATER REPORTED BY WATER PROVIDERS



Note: NR = no response, GW = groundwater, SW = surface water, EFF = effluent.

Unfortunately, the amount of water use by respondents is difficult to determine because the questionnaire did not ask respondents to identify the water use unit. In addition, a number of respondents did not provide this information. This problem will be addressed in the 2004 questionnaire, which will allow reconciliation of the information gathered in the 2003 questionnaire. Only three systems reported that zoning requirements or homeowner’s association restrictions in their service area resulted in increased water use.

SYSTEM EXPANSION

Responses indicate that growth is a significant feature in rural Arizona. Fifty-seven of the 136 respondents (42%) reported that they were expecting to expand their water distribution systems. Those expecting to serve more than 1,000 new homes within three years are located in the Bullhead City, Flagstaff, Kingman, Safford, Sierra Vista, and Yuma areas. Thirty-five water providers reported that other water companies in their communities were also expanding or that new water companies were proposed. However, only ten providers (including 3 “other”) indicated that in the next ten years they would be serving large new customers who would use an annual amount of water greater than 5% of their current total deliveries.

CENTRALIZED WASTEWATER TREATMENT SYSTEM

Whether there is a centralized wastewater collection and treatment system in a community has several implications for water supplies and management. Septic systems may represent a potential for nitrate or coliform contamination if the septic tanks are near well sites. Septic systems in developed areas may represent an opportunity for utilization of effluent if the potential exists to create a centralized water treatment system. The resulting supply of effluent could be used to meet non-potable water supply needs (park or golf course irrigation) or to recharge the aquifer.

The water provider questionnaire asked the percentage of the housing units in the service area served by a centralized wastewater treatment system. Almost half (62) of the questionnaire respondents had “no response” to this question. Septic systems are a prevalent form of treatment among respondents. Of the 75 systems that did report a housing unit number, 34 reported not having a centralized treatment system and 41 reported that some percentage was served. Almost 55% of these systems have 20% or more of their customers on septic systems.

Most of the municipally owned water system service areas that responded are also served by a centralized wastewater system, as would be expected for a larger incorporated area. However, effluent is not utilized as a water supply by most reporting systems. Only two respondents currently use effluent for irrigation. Most systems that responded have less than 100% of their customers served so there may be opportunities for system expansion and reuse. By comparison, only 14 (16%) of the “private” water systems reported that 50% or more of their households are served by a centralized wastewater system. Only one of the 14 domestic water improvement districts that responded is served by a centralized system.

Table 8 lists the number of responses to some of the yes/no format questions in the survey. Also listed is the number of incidents of no response (NR).

**TABLE 8
WATER PROVIDER RESPONSES TO SELECTED YES/NO QUESTIONS**

Question (Q#)	YES	NO	NR
Are all wells and pumps metered or measured? (Q5)	96	31	9
Are all delivery connections metered? (Q6)	95	37	4
Are private domestic wells a significant source of water for households in the area in which your water company operates? (Q13)	43	88	5
Does your water company have a conservation program? (Q18)	42	74	20
Did the drought of this last year (or years) affect your water company? (Q20)	46	82	8
Does your water company have a drought plan in place? (Q22)	18	113	5

NR = no response.

OBSERVATIONS FROM TABLE 8

METERED WELLS AND DELIVERIES

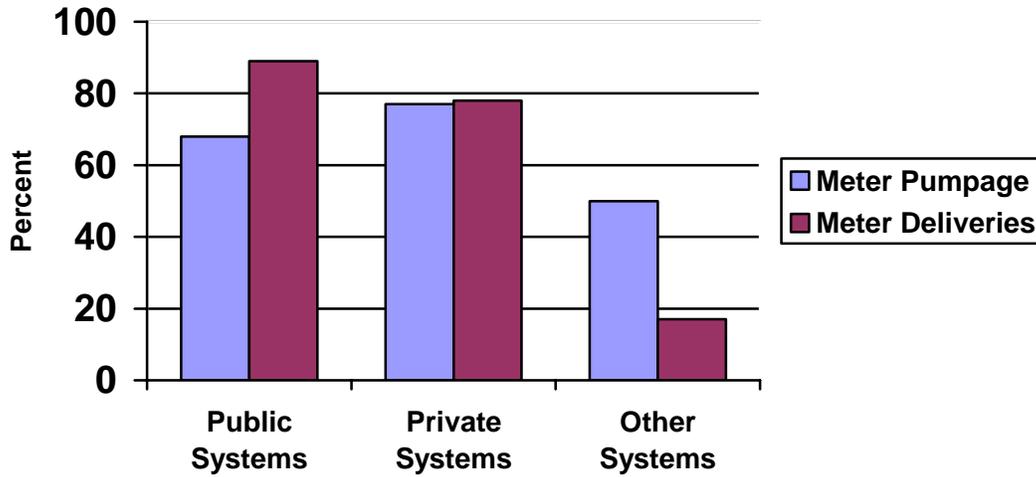
Well and delivery metering provides important information for water system management. Metering both pumpage and deliveries provides data for determining system losses, which is indicative of the condition of the delivery infrastructure. Well metering yields information on aquifer withdrawals and well productivity. Metering deliveries provides data on customer use that is important in drought and demand management and tracking the success of conservation measures and seasonal or longer-term trends.

Of the 114 municipal providers that responded, 84 reported that they metered pumpage. Some systems estimate pumpage through means such as hours of pump operation or measurement at the entrance to a storage tank. Proportionately, more private systems metered pumpage (77%) than the public systems (68%). This may be due in part to Arizona Corporation Commission (ACC) requirements. About 50% of the “other” providers metered their pumpage.

More municipal providers meter deliveries compared to pumpage since this is typically tied to revenue. About the same percentage of private systems that meter pumpage, meter deliveries (78%). A higher percentage of public systems reported that they meter deliveries (89%). As might be expected, “other” types of systems essentially pump and deliver to a single user, such as an industry or school and only four of the respondents (17%) reported metering deliveries. (See Figure 5.)

If municipal providers metered deliveries, they were asked to report the percentage of domestic hookups metered, the percentage of lost water, and the total volume delivered. There was very sporadic reporting on this question, perhaps due to a lack of information about these items. Only 43 of the municipal providers that responded provided an estimate of lost water. Of these, only 30 either metered or measured their pumpage and deliveries. Of these 30 “metered” systems, 11 reported water losses of 10% or more. Estimates of lost water ranged from zero to 60%. Reducing system losses eliminates unnecessary pumping and related costs and reduces storage needs. For systems with significant losses, loss reduction can postpone or eliminate the need to drill additional wells or secure other supplies of water to meet demand.

**FIGURE 5
PERCENT METERING BY WATER PROVIDER TYPE**



PRIVATE DOMESTIC WELLS

In some rural areas, particularly where lots are large, private domestic wells serve a significant percentage of the area population. Private domestic well use is typically not measured and is unregulated except that the well, when drilled, must be registered with ADWR and drilled by a licensed well driller. Domestic well use is an unknown quantity when evaluating area water use and developing a water budget. Estimates in the literature vary, with one acre-foot per year per well often cited.

Water providers were asked if private domestic wells were a significant source of water for households in the area in which they served. About 43 (31%) of the respondents mentioned that they were a significant source of water, but only 16 reported that private domestic wells affected their systems. The most commonly mentioned impact of domestic wells was their affect on groundwater levels in the area.

WATER CONSERVATION PROGRAM

While about 30% of the 136 water providers that responded reported that they had a conservation program, some that did not claim to have a program still provided some type of conservation information to customers such as conservation literature in their offices. The most often reported measures were:

- Conservation literature available in offices (24%)
- Conservation literature distributed to customers (20%)

- Conservation oriented rate structure (15%)
- Short-term restrictions related to drought or supply limitations (15%).

Only nine water providers reported having a program that consisted of four or more conservation measures.

Water providers were also asked what types of assistance would be of most value if they were to expand their conservation program. A limited number of water providers (33) responded to this question, and those that did most often mentioned literature for customers or a conservation oriented rate structure. While there appears to be interest in water conservation, more directed types of conservation measures such as water audits, rebate programs, and fixture replacements were rarely reported. Water providers often lack the necessary staff, training, and financial resources to implement conservation programs other than providing conservation literature. In addition, those water providers regulated by the ACC may have difficulty obtaining approval for a rate increase to offset the cost of implementing conservation measures and of lost revenue as a result of reduction in customer demand.

WATER PROVIDER ISSUES IDENTIFICATION

Providers were asked to rank 18 water-related issues that they currently faced. Tables 9, 10, and 11 show the highest priority issues mentioned by respondents. Private and public system responses included providers that gave a numeric ranking of the issues as requested and those that checked all that applied. The unshaded rows in Tables 9 and 10 are responses from those who numerically ranked the issues. Shown are: 1) the total number of responses; and 2) the number of respondents that ranked the issue among their top five. The shaded bottom row of Tables 9 and 10 are the number of unranked responses from those respondents who checked all issues that applied to their systems. With the exception of two providers, water providers categorized as “other” provided a numeric ranking. Shown in bold are the most prevalent response(s) in each of the ranking categories listed above.

**TABLE 9
PRIVATE SYSTEMS ISSUE RESPONSE (86 RESPONSES)**

	Inadequate capital for infrastructure improvement	Lowering water tables near wells	Aging infrastructure in need of replacement	Drought related supply problems	Need for additional supplies to meet future demand	Inadequate rate structure; outdated service charges	Inadequate storage capacity to meet peak demand	Ability to meet new arsenic standard
Identified as issue	23	21	21	20	19	16	15	14
Listed as a Top 5 issue	17	16	17	12	17	14	10	11
Unranked issues	13		15			10	14	10

**TABLE 10
PUBLIC SYSTEMS ISSUE RESPONSE (28 RESPONSES)**

	Aging Infrastructure in need of replacement	Inadequate capital for infrastructure improvements	Need for additional supplies to meet future demand	Inadequate pumping capacity to meet peak demand	Inadequate storage capacity to meet peak demand	Drought related supply problems
Identified as issue	10	9	8	4	4	4
Listed as a Top 5 issue	10	9	7	4	4	3
Unranked responses	5	6	5	4	4	6

**TABLE 11
OTHER SYSTEMS ISSUE RESPONSE (22 RESPONSES)**

	Inadequate capital for infrastructure improvements	Aging infrastructure in need of replacement	Ability to meet new arsenic standard	Concern about proximity of wells to sources of contamination	Lack of central wastewater treatment and collection
Identified as issue	11	8	7	6	6
Listed as a Top 5 issue	11	7	6	5	5

OBSERVATIONS FROM TABLES 9, 10, AND 11

The issue response from the questionnaire should not be inferred to represent all rural water systems, but if these responses are a reasonably representative sample, they provide an indication of what the main issues are.

- The need for infrastructure improvements, and capital to make these improvements, were mentioned by many water providers as an issue. In fact, if all infrastructure related issues are grouped together, including inadequate storage and pumping capacity, then infrastructure issues are clearly the most critical.
- Interestingly, lowering water tables near wells was mentioned as one of the most important issues by private systems but not by those public systems responding. In fact, the highest number of private systems (10) mentioned this as their top issue.
- The need for additional supplies to meet future demands was an important issue for both private and public systems.

- Water quality related issues (arsenic standard and potential for contamination) were mentioned more often by “other” systems, which in part reflects their spatial distribution, and by private systems. The standard for arsenic, a naturally occurring trace element, was recently changed from 50 to 10 micrograms per liter and some systems will have difficulty meeting that standard without financial investment. The ADEQ Arizona Arsenic Master Plan (January 2003) shows that the impact is particularly significant for small systems (serving a population of less than 10,000).
- A number of water providers identify drought among their top 5 priority issues. However, it appears that serious infrastructure and supply problems overshadow or cannot be distinguished from the effects of drought, particularly for smaller systems.
- Private systems mentioned rate issues as among their most important issues, likely because of the regulatory oversight by the ACC in setting rates.

DROUGHT IMPACTS

Providers were asked the following drought related questions:

- Did the drought of this last year (or years) affect your water company?
 - a) increased the demand for potable water
 - b) reduced the supply of potable water available
 - c) the drought did not significantly impact my water company
 - d) lowered groundwater pumping levels
 - e) increased peak demand for water
 - f) inability to meet peak demand
 - g) inability to meet general water supply needs
 - h) reduced surface water availability
 - i) trucking of water was required to meet customer needs during the drought.
- What types of assistance would be useful to you in preparing for future drought?
 - a) more advance warning about drought conditions
 - b) increased storage capacity in system
 - c) drought-triggered conservation program
 - d) ability to distribute current climate information to customers
 - e) ability to restrict deliveries to customers during droughts
 - f) ability to charge higher fees for higher volume deliveries during droughts
 - g) other.
- Is trucking water a normal part of operations?
- Do you have a drought plan in place?

While nearly 40% of the 114 municipal water provider systems that responded reported being significantly affected by the drought, only 15% reported having a drought plan. Of the systems that reported being significantly affected by drought, 43 reported an increase in potable demand and 11 reported a reduced supply of potable water. Specific system impacts related to drought were:

- Increased peak water demands (32)
- Lowered groundwater pumping levels (28)
- Unable to meet peak water demand (8)
- Unable to meet general water supply needs (4)
- Reduced supply of surface water (4)
- Trucking of water required to meet customer needs (3), although 5 reported that trucking water is a normal part of operations.

Only one system in the “other” provider category reported being significantly affected by drought.

Some jurisdictions and water providers that have had specific problems meeting water demand in their areas have instituted drought related conservation requirements and water use restrictions, including Bella Vista Water Company, Flagstaff, Payson and Pine Water Company.

Respondents indicated that increased storage capacity was the preferred type of drought assistance. There was significant interest in most other options including the ability to charge higher fees for higher volume users, a drought triggered conservation program, and the ability to restrict deliveries to customers during drought. Preferred types of drought assistance were:

- Increased system storage capacity (40%)
- Ability to charge higher fees for higher volume deliveries (32%)
- Drought triggered conservation program (26%)
- Ability to restrict deliveries to customers during droughts (25%)
- Advance warning of drought conditions (20%)
- Ability to distribute current climate information to customers (10%).

PRELIMINARY PLANNING AREA RESPONSES BY WATER PROVIDERS AND JURISDICTIONS

Water provider and jurisdiction issue identification responses by planning area were evaluated, however, no planning area-wide conclusions should be drawn from the responses at this time. It is hoped that completion of the follow-up 2004 survey, with responses from a larger number of systems, will better represent issues and conditions in the planning areas, and perhaps to the level of some groundwater basins. Preliminary information is summarized in Table 12.

Shown in Table 12 are the six rural planning areas and the number of water provider and jurisdiction responses in each geographic area. The issues list has been compressed into general categories as shown. For example the “Water Supply” category includes lowering water tables near wells, need for additional supplies to meet current or future demand, and aquifer productivity issues. In the issues section, an “X” appears if the majority of respondents identified an issue as among its top 5 in the issue category.

In the drought impact section, an “X” appears if the majority of respondents noted at least one drought impact. Because there was only one respondent from the Western Plateau, issues were not identified.

**TABLE 12
ISSUES IDENTIFICATION BY PLANNING AREA**

	PLANNING AREA					
	Eastern Plateau	Central Highlands	South-eastern	Lower Colorado	Upper Colorado	Western Plateau
Number of Water Provider and Jurisdiction Respondents	37	46	29	27	18	1
Number of Water Provider and Jurisdiction Respondents that Ranked Issues	23	24	14	17	11	
ISSUES						
Infrastructure	X	X	X	X	X	
Water Supply	X			X	X	
Water Quality		X		X		
DROUGHT IMPACT						
Majority of Respondents Noted a Drought Impact	X	X	X			

Infrastructure problems appear to be a widespread issue throughout rural Arizona. Included in this category are aging infrastructure in need of replacement, inadequate sources of capital to pay for infrastructure improvements, and lack of central wastewater treatment and collection systems. Water supply problems were also widely reported in several planning areas. Respondents in the Central Highlands and Lower Colorado Planning Areas reported water quality issues; primarily the ability to meet the new arsenic standard and concern about the proximity of wells to sources of contamination. Although drought was not a major issue for the majority of water providers and jurisdictions, at least one drought impact was reported by the majority of respondents in the Southeastern, Central Highlands, and Eastern Plateau Planning Areas.

GENERAL OBSERVATIONS

Although the questionnaires were tailored to be applicable to the three different groups of respondents, there were some cross-cutting questions. Growth was anticipated by most respondents, but few expected that growth would include large users such as an

industrial facility or prison. Relatively few respondents in any category had a water conservation program and of those that did, most programs consisted of water conservation materials. This likely reflects a lack of resources for anything more extensive since many respondents did mention the desire to expand their programs.

Half the jurisdictions, two-thirds of the counties, all the tribes, and 40% of the water providers that responded mentioned they had been affected by the drought, but very few reported having a drought plan. This underscores the need for the Statewide Drought Preparedness Plan, expected to be sent to the Governor by the Governor's Drought Task Force in October 2004. While priority issues varied between the groups, there were four that were consistently mentioned as high priorities. These high priorities included additional water supplies for future needs, lowering water tables, aging infrastructure, and inadequate sources of capital to pay for infrastructure improvements. Interestingly, while many respondents reported that domestic wells were a significant source of water for households in their area, few mentioned that they caused any problems.

NEXT STEPS

As mentioned in the introduction, the responses from this survey will be combined with corresponding responses from the more concise 2004 survey. This information will be included in the ADWR Rural Water Atlas currently being drafted. The Department envisions the atlas as an ongoing, regularly updated resource document and that a rural database, accessible to the public, will be an eventual outcome. It is hoped that the information in this report and in the Rural Water Atlas will be useful to water providers, local governments and others for informational and planning purposes, and that it will help identify the needs of the growing communities in rural Arizona and facilitate the development of solutions.

APPENDICES

Appendix A: Questionnaire Cover Letter and County and Tribal, Jurisdiction, and Water Provider Questionnaires

Appendix B: Water Provider Respondents

APPENDIX A

QUESTIONNAIRE COVER LETTER AND COUNTY AND TRIBAL, JURISDICTION, AND WATER PROVIDER QUESTIONNAIRES



STATE OF ARIZONA

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JANET NAPOLITANO
GOVERNOR

March 14, 2003

Greetings!

The State of Arizona is initiating several new programs to address the water supply issues of rural areas. There is a need to plan for and respond to the critical water supply conditions in rural communities, and to assess the impacts of drought on potable water supply, wildfires, forest health, livestock and wildlife. A Drought Task Force has been established, chaired by the Director of the Arizona Department of Water Resources, Herb Guenther, to address these issues.

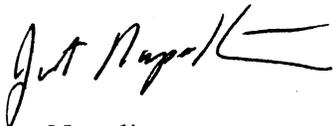
Historically, a great deal of effort has been focused on ensuring that the water supply needs of the urban areas of the state are met. The 1980 Groundwater Management Act required that the State focus on long-term water supply availability in the Active Management Areas (AMAs-see enclosed map). Although the water supply needs of these areas are not fully resolved, it is clear that there are now urgent needs to be addressed outside of AMAs. The effects of recent severe drought conditions throughout the state are being felt more acutely in rural areas. Unfortunately, long-term forecasts of below normal precipitation continue. Conditions may worsen significantly before there is any relief. Even if the drought were to end in the near future, the State is currently in no position to prepare for and mitigate the impacts of future droughts. We have no state drought strategy, and we clearly need to develop one.

A key ingredient in assisting rural areas is providing improved access to information and identifying water supply and planning needs across the State. This information will support local water supply planning efforts, help identify ways that the State can provide assistance, and provide critical information that will influence the design of our drought strategy. There is no consistent database on water supply and demand or water issues across the state. The enclosed questionnaire will provide a new source of information for drought response and water supply planning. The information is being collected by the Arizona Department of Water Resources, and will be incorporated into a database.

Please take the time to fill out the enclosed questionnaire to the best of your ability. This information is **not** being collected for regulatory purposes. If you have any questions about this questionnaire or how this information will be used, please e-mail Kathy Jacobs, project manager, at kljacobs@adwr.state.az.us or telephone (520) 770-3817 in Tucson or (602) 417-2400 ext. 7228 in Phoenix.

As your elected officials, we will move forward quickly to address the needs of rural Arizona. We thank you in advance for your assistance in helping us build a secure water future for the State of Arizona.

Very truly yours,



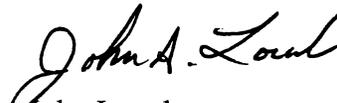
Janet Napolitano
Governor



Ken Bennett
President of the Senate


Jake Flake
Speaker of the House

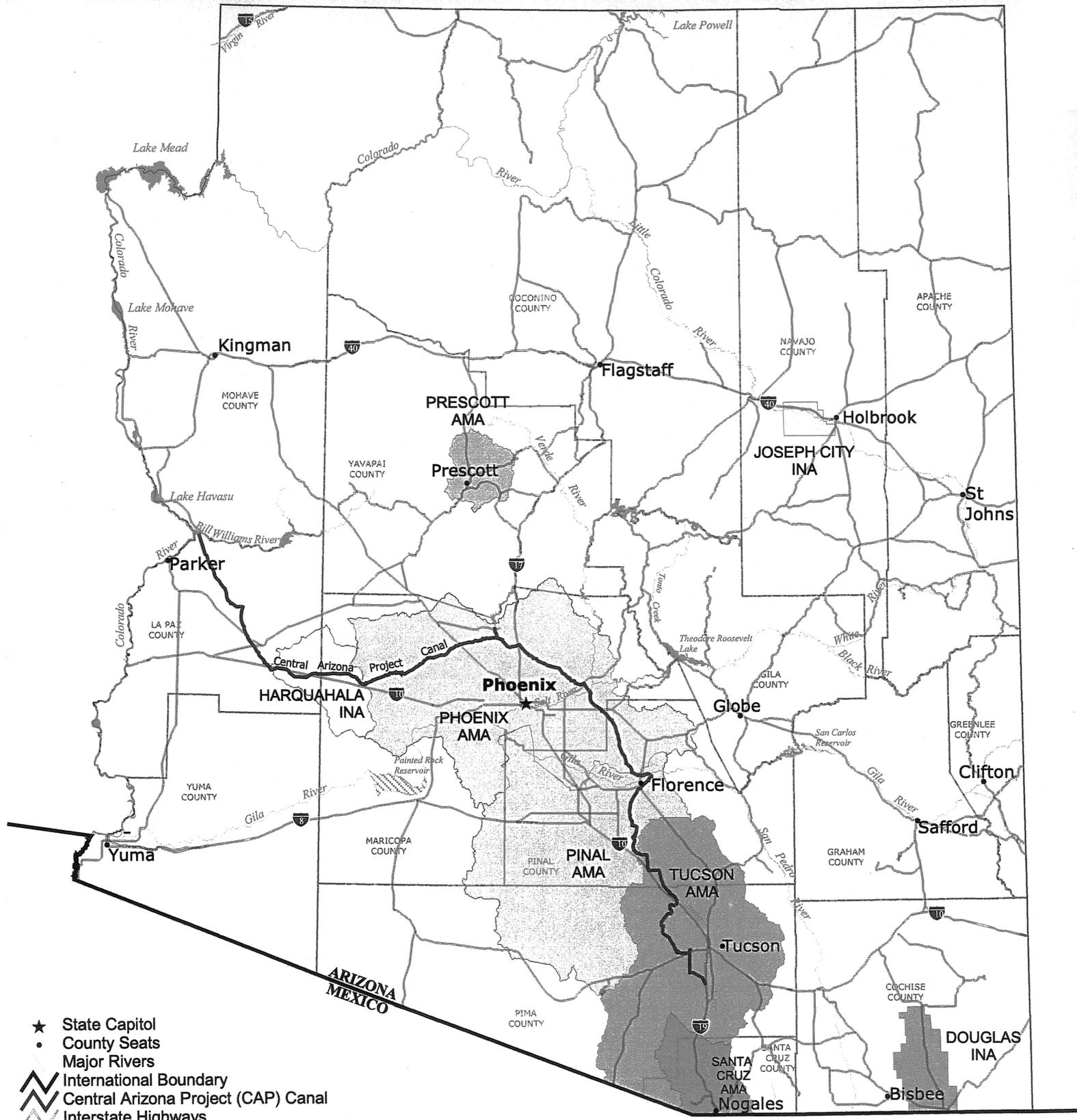
Jack Brown
Senate Minority Leader,


John Lored
House Minority Leader

Linda Binder
Chair, Senate Natural Resources
and Transportation Committee



Tom O'Halleran
Chair, House Natural Resources,
Agriculture, Water and Native American
Affairs Committee



- ★ State Capitol
- County Seats
- Major Rivers
- International Boundary
- Central Arizona Project (CAP) Canal
- Interstate Highways
- Arizona Boundary
- Counties
- Land Subject to Inundation
- Lakes and Reservoirs
- AMAs and INAs
- Douglas INA
- Harquahala INA
- Joseph City INA
- Phoenix AMA
- Pinal AMA
- Prescott AMA
- Santa Cruz AMA
- Tucson AMA



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ARIZONA AMAs AND INAs

March 12, 2003

**Rural Water Resources Study
State of Arizona/Arizona Department of Water Resources
County and Tribal Questionnaire**

The State of Arizona is developing a statewide database focused on water supply issues of rural Arizona communities. The intent is to support local planning and water supply activities, and to develop strategies to address drought and other water supply concerns. As a result of this activity, the State and the Arizona Department of Water Resources will identify key issues and ways to assist local communities, counties, Indian tribes and water companies by providing information, technical assistance, new financing mechanisms, and/or new management tools. This information will not be used for regulatory purposes. Summary results of this questionnaire will be compiled and made available to water companies, Indian tribes, local, regional and county planners and elected officials throughout the state.

Note: The State of Arizona needs your help in building an accurate and complete assessment of water supply and demand conditions in the rural parts of the state. Please help by filling out this questionnaire. If you need assistance at any time, please contact Kathy Jacobs, Arizona Department of Water Resources, at kljacobs@adwr.state.az.us or call 520-770-3817 (Tucson) or 602-417-2400 x 7228 (Phoenix).

Similar questionnaires have been distributed to water companies and jurisdictions in your area. You are encouraged to work together and/or provide assistance to water companies in responding.

PLEASE SUBMIT THE ATTACHED QUESTIONNAIRE BY APRIL 11, 2003. IF THIS DEADLINE IS DIFFICULT FOR YOU TO MEET, PLEASE SEND AN EMAIL TO KATHY JACOBS AT kljacobs@adwr.state.az.us TO LET US KNOW WHEN YOU MIGHT BE ABLE TO COMPLETE IT. THANKS!

1. a) County or tribe: _____
 b) Mailing address: _____

 c) Contact person: _____ d) Title: _____
 e) Phone number: _____ f) Fax number: _____
 g) Email address: _____

2. a) Is there a water supply plan or water resources element available for your county or tribe?
 Yes No
 b) If yes, would you be willing to provide a copy to us? Yes No (If yes, please attach it with your response or let us know how we can get a copy): _____

3. a) Do you think that the current planning process in your county or tribe is adequate from a water supply planning perspective? Yes No
 b) Why or why not? _____

4. Are there portions of your county or tribal lands that currently have inadequate water supplies to meet the demand of existing water users? Yes No
 If yes, please describe the locations of areas (township, range and section or community name) of the county or tribal lands that have water supply problems: _____

5. a) Are there any proposed large new residential developments or new non-residential or commercial/industrial facilities in the unincorporated portion of your county or within your tribal lands with significant water needs, for example, exceeding an estimated 5% of total current water use in the surrounding area of your county? Yes No
 b) If yes, what are the categories of use (electric power generation, golf courses, etc) and how much water are they likely to require annually? _____

6. a) Is lot splitting a concern in your county? Yes No
 b) If yes, please explain the nature of the problem: _____

7. What are the water-related issues currently faced by water companies within your county or tribal lands? **Please rank any issues that apply with the issue of greatest concern listed as "1":**
- a) _____ Lowering water tables near wells
 - b) _____ Need for additional water supplies to meet current demand
 - c) _____ Need for additional water supplies to meet future demand
 - d) _____ Aquifer productivity problems
 - e) _____ Aging infrastructure in need of replacement
 - f) _____ Current violations of water quality standards
 - g) _____ Past violations of water quality standards
 - h) _____ Concern about proximity of wells to sources of contamination
 - i) _____ Ability to meet new arsenic standard
 - j) _____ Ability to meet nitrate standards
 - k) _____ Inadequate capital to pay for infrastructure improvements
 - l) _____ Concern about proximity of wells to surface water flows
 - m) _____ Concern about habitat impacts related to water use
 - n) _____ Ability to meet future water supply needs of growing population
 - o) _____ Other (please specify): _____

8. What changes in legislation or other types of state assistance would be of greatest benefit to your county or tribe in ensuring secure water supplies for the future?

9. a) Does your county or tribe have a water conservation program? Yes No

If yes, what types of programs do you have:

- b) _____ conservation literature available in office
- c) _____ conservation education programs in K-12 schools
- d) _____ rebate programs for conservation investments
- e) _____ conservation oriented ordinances (landscaping, reuse, etc.)
- f) _____ conservation oriented planning policies
- g) _____ other (please specify): _____

10. a) Did the drought of this last year (or years) significantly affect your county or tribe?

Yes No

If yes, what impacts did your county or tribe experience:

- b) _____ inadequate supplies of potable drinking water
- c) _____ inadequate water supplies for grazing and wildlife
- d) _____ inadequate water supplies for fire suppression
- e) _____ other (please describe) _____

11. What types of assistance would be useful to you in preparing for future drought conditions?

12. Please list any other suggestions for improving water management in your area:

**Rural Water Resources Study
State of Arizona/Arizona Department of Water Resources
Jurisdiction Questionnaire**

The State of Arizona is developing a statewide database focused on water supply issues of rural Arizona communities. The intent is to support local planning and water supply activities, and to develop strategies to address drought and other water supply concerns. As a result of this activity, the State and the Arizona Department of Water Resources will identify key issues and ways to assist local communities, Indian tribes and water companies by providing information, technical assistance, new financing mechanisms, and/or new management tools. This information will not be used for regulatory purposes. Summary results of this questionnaire will be compiled and made available to water companies, Indian tribes, local, regional and county planners and elected officials throughout the state.

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1. a) Jurisdiction: _____
b) Mailing address: _____
c) Contact person: _____ d) Title: _____
e) Phone number: _____ f) Fax number: _____
g) Email address: _____

2. Type of water providers serving within municipal boundaries of your jurisdiction (check all that apply):
- a) _____ private water company regulated by the Arizona Corporation Commission (ACC)
 - b) _____ private water company not regulated by the ACC
 - c) _____ municipal water provider
 - d) _____ irrigation district or ditch company
 - e) _____ improvement district
 - f) _____ homeowners association or other cooperative

3. Which water companies are most likely to expand to serve new customers within your jurisdiction? Please list them:

4. What is the estimated percentage of water delivered within your jurisdiction:
- _____ groundwater
 - _____ surface water
 - _____ reclaimed water or effluent
5. _____ Total estimated residential population within your jurisdiction in 2002
6. a) Are there any proposed new non-residential or commercial/industrial facilities in your area with water needs that exceed 5% of total current water use in the surrounding water company or water use area? Yes No
- b) If yes, what is/are the category(ies) of use (e.g., electric power generation, golf course) and how much water are they likely to require annually? _____
- _____
- _____
7. Are private domestic wells a significant source of water for households in the area in which your water company operates? Yes No
8. a) Is lot splitting a significant concern within your jurisdiction or in the surrounding unincorporated area? Yes No
- b) If yes, how does lot splitting affect water supply availability for your jurisdiction? _____
- _____
- _____
9. _____ Percentage of households in your jurisdiction served by a centralized wastewater treatment and collection system.
10. What are the water-related issues currently faced by water companies within your jurisdiction? **Please rank any issues that apply with the issue of greatest concern listed as “1”:**
- _____ Inadequate reservoir or storage capacity to meet peak demand
 - _____ Inadequate well pumping capacity to meet peak demand
 - _____ Lowering water tables near wells
 - _____ Need for additional water supplies to meet current demand
 - _____ Need for additional water supplies to meet future demand
 - _____ Aquifer productivity problems
 - _____ Aging infrastructure in need of replacement
 - _____ Current violations of water quality standards
 - _____ Past violations of water quality standards
 - _____ Ability to meet new arsenic standard
 - _____ Ability to meet nitrate standard
 - _____ Inadequate sources of capital to pay for infrastructure improvements
 - _____ Concern about proximity of wells to surface water flows
 - _____ Lack of central wastewater treatment and collection systems
 - _____ Inadequate rate structure, outdated service charges
 - _____ Concern about proximity of wells to surface water flows
 - _____ Concern about habitat impacts related to water use
 - _____ Drought related water supply problems

s) _____ Other: (please specify):

11. Does your jurisdiction have a water conservation program? Yes No
If yes, what types of programs were active in calendar year 2002? (check all that apply):

- a) _____ conservation literature available in office(s)
- b) _____ conservation literature distribution
- c) _____ rebate programs for conservation investments
- d) _____ conservation oriented ordinances (landscaping, reuse, water harvesting, etc.)
- e) _____ conservation oriented hook-up policies
- f) _____ short-term water use restrictions related to drought or water supply limitations
- g) _____ other (please specify): _____

12. a) If you would like to expand your conservation program, what type of assistance would be most valuable to you? (List letters from questions 11 and/or add other suggestions):

13. Do zoning requirements or homeowners association restrictions within your jurisdiction result in increased water use? Yes No

14. a) Is there a water supply plan or water resources element available for your jurisdiction?
 Yes No

b) Is there a drought response plan available for your jurisdiction? Yes No

If yes, would you be willing to provide a copy to us? Yes No

(If yes, please attach it with your response or let us know how we can get a copy):

15. If you are familiar with the Growing Smarter program, what are the positive and negative aspects of that approach as it relates to growth and water supply planning?

**Rural Water Resources Study
State of Arizona/Arizona Department of Water Resources
Water Provider Questionnaire**

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1. a) Water company name: _____
b) Mailing address: _____
c) Contact person: _____ d) Title: _____
e) Email address: _____ f) Phone number: _____
g) ADEQ System #: _____ h) Fax number: _____

2. Type of water provider (check one):
a) _____ private water company regulated by the Arizona Corporation Commission (ACC)
b) _____ homeowners association or other cooperative not regulated by the ACC
c) _____ municipally owned water provider
d) _____ irrigation district or ditch company
e) _____ domestic water improvement district

3. Numbers of customers served (fill out each blank):
a) _____ Number of domestic connections in 2002
b) _____ Number of domestic connections in 1995 (if applicable)
c) _____ Year first domestic connection was served
d) _____ Total residential population served by your water company in 2002

4. a) Do you serve non-domestic (commercial, industrial) customers? Yes No
If yes, (fill out each blank):
Total amount of water (**Circle units:** Acre-feet, CCF, Thousands of Gallons) delivered in 2002:
b) _____ commercial/industrial
c) _____ agricultural
d) _____ turf facilities (schools, parks, cemeteries, golf courses)

5. a) Are all of your wells and pumps metered or measured? Yes No
b) If no, how do you estimate total water pumped, diverted or received? _____

6. a) Are all of your delivery connections metered? Yes No
If no,
b) _____ Percentage of your domestic hookups that were metered in 2002
If yes, (fill out both blanks):
c) _____ Percentage of lost water relative to total pumped, diverted or received in 2002
d) _____ Total water delivered in 2002

7. What are your water sources (include annual amounts pumped, diverted or received in Acre-feet, CCF or Thousands of Gallons? (**Circle units, fill out blank for each year**):

(1999)	a)	_____ groundwater	b)	_____ surface water	c)	_____ reclaimed effluent
(2000)	d)	_____ groundwater	e)	_____ surface water	f)	_____ reclaimed effluent
(2001)	g)	_____ groundwater	h)	_____ surface water	i)	_____ reclaimed effluent
(2002)	j)	_____ groundwater	k)	_____ surface water	l)	_____ reclaimed effluent

8. System information (fill out each blank):
a) How many active wells do you have? _____
b) If available, please list ADWR well registration numbers of active wells (numbers start with 55-) _____

c) How many inactive (not in service in 2002) wells do you have? _____
d) Describe trends in groundwater levels over the past ten years, including current pumping levels: _____

e) How many days of storage do you have in the delivery system at peak demand? _____

9. Expansion potential (fill out each blank):
a) Is the land area currently served by your company (the operating distribution area) likely to expand? Yes No
b) _____ Number of new domestic housing units you expect to serve in the next 3 years (include new units within the existing service area)
c) _____ Number of new domestic housing units to be served in the next 10 years

10. If you are regulated by the Arizona Corporation Commission (ACC),
a) Are the housing units you are likely to serve in the future currently _____ inside or _____ outside of your Certificate of Convenience & Necessity (CCN) boundary?
b) _____ Year you expect to reach full build-out within your current CCN boundary

11. a) Are there other water companies in your community that are expanding, or are new water companies proposed? Yes No
 b) Please list the expanding companies: _____

12. a) Are you likely to serve any large new customers (an individual commercial or industrial customer that would require an estimated amount of water greater than 5% of current total deliveries) in the next 10 years? Yes No
 If yes, (fill out the type that apply):
 b) _____ golf course or park,
 c) _____ industrial plant
 d) _____ shopping center
 e) _____ other (please list) _____
- f) Total annual water demand anticipated by large new customers (**Circle units: Acre-feet, CCF or Thousands of Gallons**)
13. a) Are private domestic wells a significant source of water for households in the area in which your water company operates? Yes No
 If yes, do you believe these private domestic wells (check any that apply):
 b) _____ affect water availability for your water company
 c) _____ affect groundwater levels in the area
 d) _____ affect water levels in flowing streams nearby
 e) _____ limit the cost-effectiveness of expanding your distribution system
 f) _____ have no effect on your delivery system
14. _____ Percentage of housing units in your service area served by a centralized wastewater treatment and collection system (estimates are fine if data are unavailable).
15. What are the water-related issues currently faced by your water company? **Please rank any issues that apply with the issue of greatest concern listed as "1":**
 a) _____ Inadequate reservoir or storage capacity to meet peak demand
 b) _____ Inadequate well pumping capacity to meet peak demand
 c) _____ Lowering water tables near wells
 d) _____ Need for additional water supplies to meet current demand
 e) _____ Need for additional water supplies to meet future demand
 f) _____ Aquifer productivity problems
 g) _____ Aging infrastructure in need of replacement
 h) _____ Current violations of water quality standards
 i) _____ Past violations of water quality standards
 j) _____ Ability to meet new arsenic standard
 k) _____ Ability to meet nitrate standard
 l) _____ Concern about proximity of wells to sources of contamination

(continued from previous page)

- m) _____ Inadequate sources of capital to pay for infrastructure improvements
- n) _____ Concern about proximity of wells to surface water flows
- o) _____ Lack of central wastewater treatment and collection system
- p) _____ Inadequate rate structure, outdated service charges
- q) _____ Concern about habitat impacts related to groundwater use
- r) _____ Drought related water supply problems
- s) _____ Other (please specify):

16. If you serve domestic water customers, what sort of rate structure do you have for domestic customers? (Check one):

- a) _____ flat rate
- b) _____ increasing block rate
- c) _____ decreasing block rate
- d) _____ other (please describe):

17. If you serve domestic water customers, what is the average single family delivery and monthly bill (fill out each blank; include any base service charge in total bill amount):

- a) _____ Average winter bill
(Circle units: Average winter delivery in CCF or Thousands of Gallons)
- b) _____ Average summer bill
(Circle units: Average summer delivery in CCF or Thousands of Gallons)

18. Does your company have a water conservation program? Yes No
If yes, what types of programs were active in calendar year 2002 (Check all that apply):

- a) _____ conservation literature available in office
- b) _____ conservation literature distributed to customers
- c) _____ conservation oriented rate structure
- d) _____ conservation education programs in K-12 schools
- e) _____ rebate programs for conservation investments
- f) _____ conservation oriented ordinances in local jurisdiction (landscaping, reuse, water harvesting, etc.)
- g) _____ conservation oriented hook-up policies
- h) _____ short-term water use restrictions related to drought or water supply limitations
- i) _____ offer low water use conservation devices (please specify):

j) _____ other (please specify):

19. If you would like to expand your conservation program, what type of assistance would be most valuable to you? (List letters from question 18 and/or add other suggestions):

20. Did the drought of this last year (or years) affect your water company? (Check all that apply):

- a) _____ increased the demand for potable water
- b) _____ reduced the supply of potable water available
- c) _____ the drought did not significantly impact my water company

Please list any other impacts that your company experienced:

- d) _____ lowered groundwater pumping levels
- e) _____ increased peak demand for water
- f) _____ inability to meet peak demand
- g) _____ inability to meet general water supply needs
- h) _____ reduced surface water availability
- i) _____ trucking of water was required to meet customer needs during the drought

21. Is trucking of water part of normal operations for your water company? Yes No

22. Does your water company have a drought plan in place? Yes No

If yes, (please attach the drought plan to this questionnaire or tell us how we can get a copy):

23. What types of assistance would be useful to you in preparing for future drought (Check all that apply):

- a) _____ more advance warning about drought conditions
- b) _____ increased storage capacity in system
- c) _____ drought-triggered conservation program
- d) _____ ability to distribute current climate information to customers
- e) _____ ability to restrict deliveries to customers during droughts
- f) _____ ability to charge higher fees for higher volume deliveries during droughts
- g) _____ other (please describe): _____

24. Do zoning requirements or homeowners association restrictions in your service area result in increased water use? Yes No

25. Do you have any other suggestions for improving water management in your area?

Thank you!

**Please mail this form to: Kathy Jacobs
Arizona Department of Water Resources
500 N. Third Street, 4th Floor
Phoenix, AZ 85004**

APPENDIX B

WATER PROVIDER RESPONDENTS

APPENDIX B
Water Provider Respondents

Type of Water Provider*	
domestic improvement dist.	303 Domestic Water Improvement District
domestic improvement dist.	Chloride Domestic Water Improvement District
domestic improvement dist.	Clay Springs DWID
domestic improvement dist.	Congress Domestic Water Improvement District
domestic improvement dist.	Golden Valley Improvement District #1
domestic improvement dist.	Pine Creek Canyon Domestic Water Imp. Dist.
domestic improvement dist.	Pine Water Asso. Domestic Water Improvement Dist.
domestic improvement dist.	Pinedale Domestic Water Improvement District
domestic improvement dist.	Pomerene Domestic Water Improvement District
domestic improvement dist.	Porter Mt. DWID
domestic improvement dist.	Sky-Hi Domestic Water Improvement District
domestic improvement dist.	St. David Domestic Water Improvement District
domestic improvement dist.	Vernon Domestic Water Improvement Dist.
domestic improvement dist.	Wenden Domestic Water Improvement District
municipally owned	City of Benson
municipally owned	City of Flagstaff
municipally owned	City of Page
municipally owned	City of San Luis
municipally owned	City of Somerton Municipal Water
municipally owned	City of Winslow Water System
municipally owned	Eagar Municipal Water
municipally owned	Fredonia Town Water Dept.
municipally owned	Gila Resources (Safford)
municipally owned	Kingman Municipal Water System
municipally owned	Lake Havasu City
municipally owned	Tombstone Water Department
municipally owned	Town of Huachuca City
municipally owned	White Hills Mobile Home Park
private, regulated by ACC	Abra Water Company
private, regulated by ACC	Ajo Improvement Company
private, regulated by ACC	Alpine Water System, Inc.
private, regulated by ACC	Antelope Water Co., Inc.
private, regulated by ACC	Arizona American Water
private, regulated by ACC	Arizona American Water
private, regulated by ACC	Ash Fork Water Service
private, regulated by ACC	Bella Vista Water Co., Inc.
private, regulated by ACC	Big Park Water Company
private, regulated by ACC	Bradshaw Mountain View & Humboldt Water
private, regulated by ACC	Cedar Grove Water Co.
private, regulated by ACC	Clear Springs Utility Co.
private, regulated by ACC	Clemenceau Water Company
private, regulated by ACC	Coldwater Canyon Water Co.
private, regulated by ACC	Country Club Acres Water Co.
private, regulated by ACC	Dateland Public Service Co., Inc.
private, regulated by ACC	Doney Park Water
private, regulated by ACC	Eagletail Water Company
private, regulated by ACC	Eden Water Company, Inc.
private, regulated by ACC	Ehrenberg Utilities Association
private, regulated by ACC	El Prado Water Co.
private, regulated by ACC	Far West Water & Sewer, Inc.

APPENDIX B
Water Provider Respondents

private, regulated by ACC	Fool's Hollow and Park Valley Water Companies
private, regulated by ACC	Ford Motor Company - Arizona Proving Ground
private, regulated by ACC	Forest Highlands Water Co.
private, regulated by ACC	Gadsden Water Co., Inc.
private, regulated by ACC	Gladden Water Company
private, regulated by ACC	Graham County Utilities, Inc.
private, regulated by ACC	Green Acres Water Co.
private, regulated by ACC	Hillcrest Water Co.
private, regulated by ACC	Kohl's Ranch Water Company
private, regulated by ACC	Livco Water Company
private, regulated by ACC	Mescal Lakes Water Systems
private, regulated by ACC	MHC Inc., dba Sedona Venture Water Company
private, regulated by ACC	Michael's Ranch Water Users' Association
private, regulated by ACC	Mohawk Utility Company
private, regulated by ACC	Montezuma Heights Water & Airport Co., Inc.
private, regulated by ACC	Mormon Lake Water Co.
private, regulated by ACC	Mountain Dell Water, Inc.
private, regulated by ACC	Naco Water Company, LLC
private, regulated by ACC	North Mohave Valley Corp.
private, regulated by ACC	Oak Creek Water Co. #1
private, regulated by ACC	Peaceful Valley Ranch
private, regulated by ACC	Peebles Valley Water Co.
private, regulated by ACC	Pine Valley Water Co.
private, regulated by ACC	Pinecrest Water Co., Inc.
private, regulated by ACC	Pineview Water Company, Inc.
private, regulated by ACC	Ponderosa Utility Corp.
private, regulated by ACC	Pueblo del Sol Water Company
private, regulated by ACC	Rosewood Ranch
private, regulated by ACC	Serviceberry Water Co.
private, regulated by ACC	Shangri-La Water Works
private, regulated by ACC	Silver Well Svc. Corp. & Bourdon Ranch dba WATCO
private, regulated by ACC	Southwestern Research Station
private, regulated by ACC	Stratman Water Company
private, regulated by ACC	Sun Valley Utilities, Inc.
private, regulated by ACC	Sunrise Vistas Utilities
private, regulated by ACC	The Willows Mobile Home Park
private, regulated by ACC	Tonto Creek Utility Co.
private, regulated by ACC	Tortilla Flat
private, regulated by ACC	Valley Pioneers Water Co., Inc.
private, regulated by ACC	Verde Lakes Water Corp.
private, regulated by ACC	Verde Lee Water Co., Inc.
private, regulated by ACC	Walnut Creek Water Co., Inc.
private, regulated by ACC	Willow Valley Water Company, Inc.
private, regulated by ACC	Winchester Water Company, LLC
private, regulated by ACC	Yarnell Water Improvement Association
HOA/co-op, not regulated	Alpine Highlands Water Company
HOA/co-op, not regulated	Buckskin Artists Community Water
HOA/co-op, not regulated	Golden Horse Shoe Ranches
HOA/co-op, not regulated	Holy Trinity Monastery
HOA/co-op, not regulated	Katherine Cabin Site Associate Inc.
HOA/co-op, not regulated	Lamplighter RV Resort
HOA/co-op, not regulated	Montezuma Estates Property Owners Assoc.

